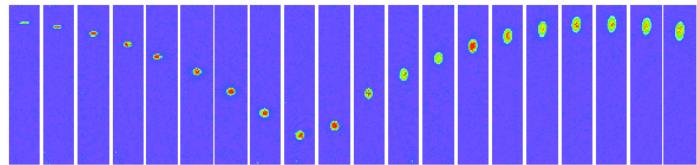


Quantum Institute Workshop

Quantum Institute Briefing Center; December 9–10, 2002

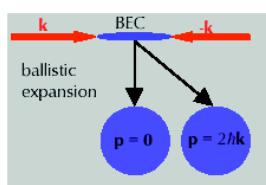
1. Magnetic mirrors for Bose condensates

A.S. Arnold, C. MacCormick, M.G. Boshier, Phys. Rev. A65, 031601 (2002)

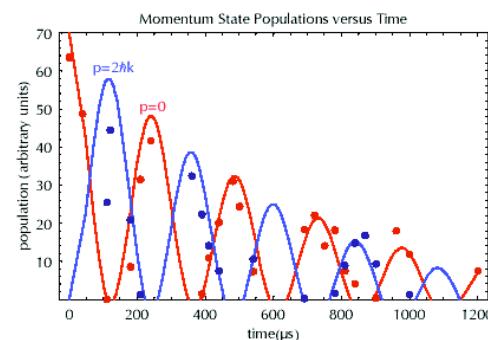


Sequence shows BEC reflected from a pulsed magnetic mirror. Comparing this evolution with theory implies a deviation from perfect specularity of less than 1 mrad.

2. Damping of two-photon Rabi oscillations



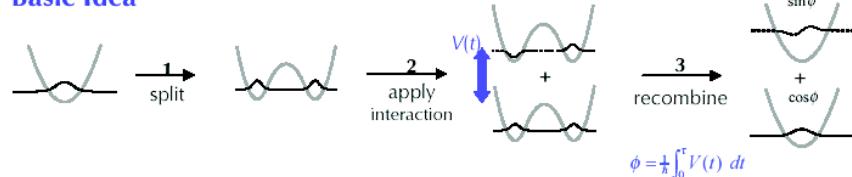
Damping due to *s*-wave elastic scattering into unoccupied modes is not described by the Gross-Pitaevskii equation.



3. BEC waveguide interferometer

E.A. Hinds, C.J. Vale, and M.G. Boshier, Phys. Rev. Lett. 86, 1462 (2001)

Basic Idea

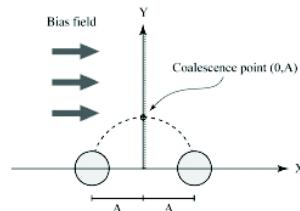


Advantage of waveguide geometry

Long interaction times give high sensitivity. E.g. for a 10^6 atom BEC split vertically by 1mm for 10s, $\delta g/g \sim 5 \times 10^{-11}$.

Implementation

1. Time-averaged optical dipole potential.
2. Magnetic potential from two long wires + bias field



**Presenter: Dana Berkeland
for Malcolm Boshier**